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Discovery of Fossil Cretaceous Bird in Southwest Arkansas

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During a field trip to the Middle Fork of Ozan Creek, Sec. 30, T. 10 S., R. 25 W., in Hempstead Co., AR in January, 1991, the junior author found a light brown, highly permineralized bone atop a gravel bar. The specimen, SAU 204, has been reposited with the Geology Department of Southern Arkansas University.

The specimen, 1.3 cm by 1.6 cm in cross-section, is 12.1 cm long and has a mass of 49.8 grams. It is interpreted as being part of the distal end of a left tarsometatarsus bone (Fig. 1) which preserves the articulation of only Digit IV. As Olsen (1979) states, "Perhaps no single bone is more readily recognized by workers with little or no experience in avian osteology than the uniquely structured tarsometatarsus. This is because of the distal end of the element, which terminates in three, more or less, distinct, rounded articular condyles or trochlea."

The geologic map of Arkansas (Haley, et al., 1976) assigns the bedrock at the discovery site to the Ozan formation of the late Taylor group (Campanian) in the Cretaceous period. The Ozan formation has been correlated with the Wolfe City Sand of Texas by Pessagno (1969).

Therefore, on the basis of the age of its source rocks and of its large size, SAU 204 is referred to the Cretaceous genus of toothed birds, *Hesperornis*, originally discovered by O.C. Marsh in 1870 and described in his monograph *Odontornithes* of 1880. Dr. Larry Martin of the University of Kansas concurs with this assignment, having compared SAU 204 directly with *Hesperornis*. Several species of *Hesperornis* have been erected for specimens recovered from sediments of the seaway that stretched from the Gulf of Mexico to the Arctic Ocean and covered southwestern Arkansas. SAU 204 constitutes the first known occurrence in Arkansas of this unusual lineage of birds. Martin (pers. comm., 1996) sees the specimen as the southernmost known individual of the genus and as one of the largest individuals recovered to date, possibly representing a new taxon.

The proportions of body parts in published figures such as Romer, 1964, and Feduccia, 1996, (both after Marsh, 1880) suggest that SAU 204 preserved about 75% of its original length. *Hesperornis* had tiny wings supported only by the remains of the humerus and relied on powerful feet for swimming. Its legs were oriented in such a fashion that the living creature probably could not stand upright, as seen in the standard reconstruction, but lay and moved upon the ground like a modern seal or sea lion (figure on page 160, Feduccia, 1996).

A typical Late Cretaceous marine fauna occurs with the *Hesperornis* specimen in the Ozan Creek gravel bars, but none of these elements have been found *in situ* to date. Shark teeth, perhaps referrable to *Squalicorex* and *Scapanorhynchus* (see Welton and Farish, 1993) have been found. Two calcified shark vertebrae 7.0 cm in diameter indicate how large these predators could grow. Sawfish rostral spines, genus *Ischyrhiza*, appear in some abundance, but no skate or ray teeth have been found, though they appear in the vicinity of Lake Millwood to the west of Ozan Creek. A single fragment of the mid-section of a fish fin spine 1.5 cm by 2.4 cm that is 7.5 cm long has been recovered. John G. Maisey, American Museum of Natural History, tentatively places it among the chimeroids because it has a concave posterior surface, it is straight and slender, and it is found in Late Cretaceous deposits (pers. comm., 1997).

Bony fish are represented by the small hooked teeth of *Stephanodus (Ancistrodon)*, by the fangs and jaw bones of the barracuda-like *Enchodus*, by the hypopleural bone at the base of the tail of *Protosphyraena* (J.D. Stewart, pers. comm., 1995) and by an elongated tooth plate of *Pycnodus*.

Mosasaur vertebrae with their distinctive ball and socket articulations are occasionally recovered. A jaw fragment with four teeth has been tentatively assigned to *Clidestes* by Gordon L. Bell, Jr., (pers. comm. 1996) based on its size, gracile proportions and lack of wear facets on the teeth. Dr. Willis Beene, D.D.S. of Magnolia, AR, attempted a dental X-ray examination of this specimen for un-erupted teeth, but results were inconclusive.

Four aceolous vertebrae of pliosaur marine reptiles are in hand, and one pliosaur leg bone, SAU 205, has been found and donated by Terry Sanders of Magnolia. The humerus (SAU 198) of a marine turtle with a carapace length estimated to exceed three feet was found in two pieces. It cannot belong to *Protostega* since its shaft is straight. Dr. Ed Hooks has noted its resemblance to *Toxochelyes* (pers. comm., 1995), but it is easily twice the size of the specimens in the Field Museum of Chicago.

We wish to gratefully acknowledge the assistance of Drs. Martin, Stuart, Bell and Massey in the identification of specimens. Ms. Stacy Sanders of the Southern Arkansas University art department prepared the figure.

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Fig. 1. Left tarsometatarsus bone (SAU 204).

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